

# Unit Planning Guide: Grade   6   Unit   6   of   8

Unit Title: Geometry	Pacing (Duration of Unit): 5 weeks
Grade: 6	Buffer Day(s):

## Transfer Goals

*Students will be able to independently use their learning to:*

- **Make sense of problems and persevere in solving them.**
- Reason abstractly and quantitatively.
- **Construct viable arguments and critique the reasoning of others.**
- **Model with mathematics.**
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

## Established Goals (2011 MA Curriculum Frameworks Standards Incorporating the Common Core State Standards)

Standards (Priority Standards in bold):

- 6.G.1 Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.**  
 MA.1.a. Use the relationships among radius, diameter, and center of a circle to find its circumference and area.  
 MA.1.b. Solve real-world and mathematical problems involving the measurements of circles.
- 6.G.2 Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas  $V = lwh$  and  $V = bh$  to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.**
- 6.G.3 Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.
- 6.G.4 Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface areas of these figures. Apply these techniques in the context of solving real-world and mathematical problems.**

**WIDA for English Language Learners**  
 Standard 1: ELLs **communicate** for **Social** and **Instructional** purposes within the school setting  
 Standard 3: ELLs **communicate** information, ideas and concepts necessary for academic success in the content area of **Mathematics**

In the lesson planning stage, teachers will need to differentiate lessons for ELLs. In order to accomplish this they will need: 1.) this curriculum map, 2.) a list of their ELLs and their proficiency levels, and 3.) appropriate language function expectations and scaffolds or supports.

Big Ideas:	Essential Questions:
<ul style="list-style-type: none"> <li>• The area of irregular and regular polygons can be found by decomposing the polygon into rectangles, triangles and other shapes.</li> <li>• Manipulatives and the construction of nets may be used in computing the surface area of rectangular and triangular prisms, and volume of right rectangular prism.</li> <li>• Formulas may be used to compute the areas of polygons, surface areas of rectangular and triangular prisms, and volumes of right rectangular prisms.</li> <li>• Appropriate units of measure should be used when computing the area (square units) of polygons, and surface area (square units) and volume of prisms (cubic units).</li> <li>• Views of rectangular and triangular prisms may be interpreted and sketched to provide a 2D representation of a 3D figure.</li> <li>• Fractional edge lengths are equivalent to the dimensions of solid figures.</li> <li>• The volume of a solid figure is the number of same sized cubes filling the space so that there are no gaps and overlaps.</li> </ul>	<ul style="list-style-type: none"> <li>• How does area, surface area, and volume relate to living in a 3D world?</li> <li>• How does geometry influence art and engineering development and design?</li> <li>• What does area tell you about a figure?</li> </ul>

Acquisition (*Mostly assessed through traditional summative assessments)	
<p><b>Knowledge:</b> Key basic concepts, facts, and key terms (written in phrases) students should be able to recall independently.</p> <p><i>Students will know ...</i></p> <ul style="list-style-type: none"> <li>• That decomposing shapes into rectangles and triangles is essential for finding area (decomposing into “visual parts”)</li> <li>• Finding volume can include using the formula or “filling/packing” a solid with unit cubes</li> <li>• That the coordinate plane can be used as a tool to find perimeter and area</li> <li>• That 3D figures can be represented with a net</li> <li>• The resulting net of 3D figures can help solve for area, surface area, or volume</li> </ul>	<p><b>Skills:</b> The discrete skills and process students should be able to use independently (<u>Bloom’s Level of Learning</u> should be noted in parentheses.)</p> <p><i>Students will be skilled at:</i></p> <ul style="list-style-type: none"> <li>• Finding the area of triangles, quadrilaterals, and other polygons by composing rectangles or breaking them into triangles and other shapes. (application)</li> <li>• Representing and using nets to find surface area of rectangles and triangles (application)</li> <li>• Applying net techniques in real-world and mathematical problems (application)</li> <li>• Determining whether to find area, surface area, or volume in a given situation (evaluation)</li> <li>• Finding volume using whole or fractional units (application)</li> <li>• Determining unknown ordered pairs using the characteristics of polygons (application)</li> </ul>

<p><b>Vocabulary:</b></p> <ul style="list-style-type: none"> <li>• compose</li> <li>• coordinate pair</li> <li>• coordinate plane</li> <li>• coordinate system</li> <li>• coordinates</li> <li>• decompose</li> <li>• diagonal</li> <li>• formula</li> <li>• surface area</li> <li>• net</li> </ul>	<p><b>Knowledge Questions:</b></p> <ul style="list-style-type: none"> <li>• How do you find the area of right triangles, other triangles, special quadrilaterals, and polygons?</li> <li>• How do you compose and decompose polygons to create other figures?</li> <li>• What is volume?</li> <li>• How do you find volume?</li> <li>• What is the difference between volume and surface area?</li> <li>• How do you name a prism based on its attributes and characteristics?</li> <li>• What is a net?</li> <li>• How do you transform a 3D figure into a net?</li> <li>• How do you find the surface area of a 3D figure using nets?</li> <li>• Can two shapes have the same volume but different surface areas, why?</li> <li>• Can two figures have the same surface area but different volumes?</li> </ul>
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